

New Hampshire Regional Haze SIP Revision Response to EPA's Comments

NHDES received comments from the U.S. Environmental Protection Agency (EPA) on New Hampshire's preliminary draft Regional Haze SIP. The purpose of these comments was to provide early feedback on New Hampshire's efforts, focusing on information specific to New Hampshire. NHDES made substantive changes to the draft SIP in the period following receipt of EPA's comments on July 10, 2008, before distributing a revised version to EPA and the FLMs on July 22, 2008. NHDES received additional comments from EPA on the revised draft SIP in a letter dated October 24, 2008.

The following is a point-by-point response to specific comments by EPA. Because the SIP document has been repaginated, reference is made to sections or parts instead of page numbers. **Comments are written in *italics* and responses are written in regular font.**

2. Areas Contributing to Regional Haze – *“The fifth paragraph on page 17 [now page 16] discusses the decline in sulfate concentration expected in the Great Gulf and Presidential Dry River Wilderness areas by 2018. The discussion should indicate which modeling results/control strategies are being used to develop these projections.”*

The following has been added to the text: “The modeling that produced these results is described in Section 7, Air Quality Modeling, and in ‘2018 Visibility Projections,’ May 13, 2008 (Attachment Q). The emission control programs responsible for the projected visibility improvements are described in Section 11, Long-Term Strategy.”

2.2 States Contributing to Visibility Impairment in New Hampshire's Class I Areas – *“In the discussion of states or regions contributing to visibility impairment at New Hampshire's Class I areas, MANE- VU is noted as contributing 27.83% (per Table 2.2). The next highest contribution is from ‘Other’ at 23.54%. Given the magnitude of this category relative to the total MANE-VU contribution, NH should include some discussion of the components of the ‘Other’ category.”*

A statement defining the “Other” category has been added to the text.

3.2.2.2 Meeting the "Ask" – New Hampshire – *“Merrimack Station and Newington Station have both been identified as BART sources and as two of the top 167 stacks contributing to visibility impairment in a MANE- VU Class I area. The MANE- VU "Ask" requests that the 167 stacks be controlled to the 90% level. This section of New Hampshire's SIP states that NHDES has determined that 90% control is not reasonable for the Newington station at this time but that NHDES anticipates that controls installed at the Merrimack station will result in over-compliance thereby partially offsetting the lesser control at Newington. According to the BART determination, however, Merrimack station is only expected to be controlled at the 90% level. NHDES should explain why 90% control of SO₂ at Newington is not reasonable and why BART for SO₂ at Merrimack station is set at 90% if the level of control is expected to be greater than 90%.”*

A required minimum control level of 90 percent for SO₂ emissions has been included as an operating condition in Merrimack Station's air permit. As a practical matter, because no facility can operate exactly at the minimum required performance level in a continuous

fashion without excursions, it will be necessary to overshoot the minimum to ensure compliance. In actual practice, therefore, the effective level of SO₂ emission reductions is expected to exceed 90 percent on average. Furthermore, the air permit requires the facility to achieve the maximum sustainable rate of control (above the specified minimum) as determined from NHDES's review of monthly performance data submitted after December 31, 2014. It is important to note that the FGD for Merrimack Station will be optimized for mercury reductions (80% minimum), with performance guarantees for same. The vendor would not provide a simultaneous guarantee for SO₂ removal. Nevertheless, the expectation is that this FGD system will provide an SO₂ control level not significantly different from units optimized for SO₂ reduction.

With respect to Newington Station, the facility's low capacity factor, coupled with the high cost of flue gas desulfurization (estimated to be well in excess of \$1,000/kW for this facility), make 90 percent control of SO₂ economically infeasible.

Section 9, Best Available Retrofit Technology (BART), and Attachment X, BART Analyses for Sources in New Hampshire, have been revised and expanded to provide further description of these matters.

3.2.5 State/Tribe and Federal Land Manager Coordination – *“As noted on page 32, the Regional Haze rule requires a 60 day comment period for Federal Land Managers (FLMs) before the public hearing. While timing may preclude the development of a response to these comments before the hearing, we recommend that any comments submitted by the FLMs be included in the materials provided for the public hearing.”*

NHDES has incorporated responses to the FLMs' comments into the draft final SIP more than 30 days prior to the public hearing.

6.3.1 Stationary Point Sources – *“On page 51, regarding Electrical Generating Units (EGUs) emissions inventories, there is discussion of the use of continuous emissions monitoring (CEM) data to develop hourly emissions profiles. Although use of CEM data makes sense given its high degree of accuracy, emissions from EGUs can vary widely from one day to another, and also vary greatly from season to season. How were the CEM hourly emissions profiles determined? NH should note that use of seasonal or annual average profiles may lead to an underestimation of visibility impacts on the worst 20% days. NH should include additional detail on how CEM data was used to develop hourly emission profiles.”*

The text states: “The base-year inventory for EGU sources was based on 2002 continuous emissions monitoring (CEM) data reported to EPA in compliance with the Acid Rain Program or 2002 state emissions inventory data. The CEM data provided actual hourly emission values used in the modeling of SO₂ and NO_x emissions from these large sources...” The relevant fact is that the data employed for the base-year inventory were actual hourly emissions values taken directly from the CEM outputs. Therefore, the original description is accurate. The following has been added to the text: “See Chapter II, Section A.2.a.i of the ‘Technical Support Document for 2002 MANE-VU SIP Modeling Inventories,’ Version 3 (Attachment M) for a discussion of the quality assurance steps performed on the CEM data that were included in the 2002 baseline modeling inventory.”

6.4 Summary of Emissions Inventories – *“It is not clear why there is such a significant drop in PM 10 from area sources between the 2018 BOTW and 2018 most recent modeling (Table 6-3 VB. Table 6-4). NH should provide additional detail on this issue.”*

The following footnote was added to Table 6.4 to explain discrepancies in area source PM₁₀ values among the four tables:

“An adjustment factor was applied during the processing of area source emissions data to restate fugitive particulate matter emissions. Grid models have been found to overestimate fugitive dust impacts when compared with ambient samples; therefore, an adjustment is typically applied to account for the removal of particles by vegetation and other terrain features. The summary emissions for PM₁₀ in Table 6.4 reflect this adjustment. Comparable adjustments were not made to PM₁₀ values listed in Tables 6.1 through 6.3.”

9.4.1 BART Determinations and Required Control Levels –

“The attachment which details the analysis for New Hampshire's BART sources has not been provided. EPA needs to review this attachment in order to determine if New Hampshire's BART determinations and required control levels are reasonable. However, we do have some preliminary feedback on the limited information that was provided in main text.”

The relevant attachments included with the SIP are as follows:

ATTACHMENT W – MANE-VU Five-Factor Analysis of BART-Eligible Sources

ATTACHMENT X – BART Analyses for Sources in New Hampshire

ATTACHMENT Z – Assessment of Control Technology Options for BART-Eligible Sources

“Table 9.2 indicates that the BART emission limit for Newington Station unit NT-1 is ‘limited to no more than 1.0% sulfur by weight for #6 fuel oil.’ The MANE-VU BART Workgroup Recommendations DRAFT Presumptive Control Levels (Updated September 7, 2006) for Non-CAIR EGUs is to use 0.3% sulfur content oil. Was this level of control analyzed?”

A review of fuel oil availability indicates that reliable supplies of residual fuel oil with a sulfur content of 0.5% or lower cannot be assured over the near term. Therefore, use of ultra-low-S residual fuel oil cannot be recommended as BART at this time. The question of ultra-low-S fuel availability will be reviewed and reconsidered in advance of the first regional haze progress report in 2013.

“In addition, Table 9.2 indicates a BART control level of 80% control of SO₂ for Merrimack Station and 50% control of SO₂ for Newington Station. Both of these sources are included in the MANE-VU ‘167 stacks.’ MANE-VU is requesting 90% control of the 167 stacks. On page 28, New Hampshire states, ‘NHDES has determined that controlling the latter facility (Newington) to the 90 percent level of the Ask is not reasonable at this time and will seek alternative measures to achieve the equivalent overall reduction in SO₂ emissions.’ NH should include a discussion of the analysis that led to this determination, as well as more information on the referenced alternative measures.”

Please see response given for 3.2.2.2 regarding the 90% percent control level for SO₂ emissions. The 80% control level is for mercury emissions, for which Merrimack Station will be optimized. The FGD system controlling mercury emissions to this level is expected to achieve a simultaneous reduction in SO₂ emissions of *at least* 90%. NHDES believes that actual SO₂ emission reductions in excess of 90% for Merrimack Station, coupled with

lower emissions resulting from the use of low-sulfur fuel and recently reduced utilization rates for Newington Station after the 2002 baseline year, will yield overall SO₂ emission reductions equivalent to the Ask. These reductions do not count potential benefits from additional control measures that would reduce SO₂ emissions or yield equivalent reductions in other visibility-impairing pollutants – including but not limited to further emission controls for industrial, commercial, and institutional boilers; strengthened controls on various VOC sources, and use of ultra-low-sulfur fuels. NHDES will be examining the feasibility of implementing additional control measures in advance of the first regional haze progress report in 2013.

“Furthermore, Tables 9.3 and 9.4 indicate that, for NO_x and PM, respectively, ‘current controls (ESP, SCR, etc.) are BART.’ It should be noted that BART requirements must be federally enforceable. Therefore, the BART discussion should reference the specific existing federally enforceable requirements that require these ‘current controls.’ Alternatively, if the requirements implementing the current controls are not yet federally enforceable, they must be submitted to EPA as a SIP revision.”

Enforceable emission control requirements for Merrimack Station Unit MK2 and Newington Station Unit NT1 are specified in the current air permits for these facilities: Merrimack Station, Temporary Permit #TP-0008; and Newington Station, Title V Operating Permit #TV-OP-054.

“As mentioned on page 81, 40 CFR 51.308(e)(1)(A) states ‘The determination of BART (Best Available Retrofit Technology) must be based on an analysis of the best system of continuous emission control technology available and associated emission reductions achievable for each BART-eligible source that is subject to BART within the State. In this analysis, the State must take into consideration the technology available, the cost of compliance; the energy and non-air quality environmental impacts of compliance, any pollution control equipment in use at the source, the remaining useful life of the source and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology.’

“Although NHDES referenced the MANE-VU five factor analysis of BART-eligible sources for available control options and general analysis of the required factors, additional detail is needed specific to the New Hampshire BART sources, particularly in the areas of expected visibility improvement and cost of compliance. This is especially important in the case where NHDES is proposing a level of control less stringent than that recommended by the MANE-VU BART workgroup.”

The BART analyses for New Hampshire’s two BART-eligible sources have been revised and expanded to provide a more complete description of visibility improvements and estimated control costs. See Section 9, Best Available Retrofit Technology (BART), and Attachment X, BART Analyses for Sources in New Hampshire.

Merrimack Station, SO₂:

“Under the ‘Available Retrofit Technologies for SO₂ Control,’ New Hampshire discusses control via a wet flue gas desulphurization (FDG or “scrubber”) system. This discussion indicates that FDG ‘can be designed to remove greater than 95 percent of incoming SO₂.’ Therefore, NHDES should explain why New Hampshire is proposing a final control level of only 90%.”

“Page 82, Footnote 17 - This footnote indicates that the New Hampshire Clean Powers Act requires an 80% control level from the FGD. It further indicates that once the unit demonstrates a sustainable control level greater than 80%, the requirement is raised to that higher level. NHDES should expand on what is considered demonstrating a sustainable control level and the anticipated timeframe for achieving this higher level of control.”

Please see response given for 3.2.2.2. New Hampshire has specified a *minimum* SO₂ control level of 90% for Merrimack Station. The *actual* control level may approach the 95% rate that is typical of new FGD systems. The reference to 80% control is for mercury emissions, for which Merrimack Station will be optimized. Clarifying language on emission rates and expected control levels is provided in Section 9 and Attachment X of the SIP revision.

Merrimack Station, PM₁₀:

“The Appendix X discussion of the current control level in respect to PM₁₀ for the Merrimack unit lists the current control as electrostatic precipitators (ESP)s with a control level of 85%. On page 84, Table 9.4, ‘PM₁₀ Emission Reductions Resulting from Application of BART Controls,’ lists the current control as 97% control. NHDES should clarify whether 85% or 97% is the current level of control, and clearly state what level of control has been determined to represent BART.”

The BART determination for Merrimack Station Unit MK2 calls for the continued use of the two ESPs in series, at existing control levels. Based on emissions records for the 2002 baseline year, the control levels were estimated to be 99+% for total filterable PM and 97% for filterable PM₁₀ (not accounting for condensable fraction of particulate matter).

Newington Station, SO₂:

“Newington Station is one of the 167 stacks which impacts a Class 1 area as well as a BART source. FGD would be expected to reduce SO₂ emissions by 95%, while New Hampshire’s proposal to require 1 % sulfur fuel would only achieve a 50% reduction. In addition, the MANE-VU ‘ask’ includes 0.5% sulfur fuel for the 167 stacks and 0.3% sulfur fuel has been recommended as BART by the MANE-VU BART workgroup. Therefore, it is not clear why New Hampshire has determined that a less stringent requirement of 1 % sulfur fuel represents BART for this source. NHDES should include an analysis of the feasibility of implementing these other control strategies at Newington as well as a discussion of the visibility impacts of various strategies, especially if NHDES determines that an option less stringent than the MANE-VU recommendations is BART.”

Please see previous response given for 3.2.2.2 regarding the 167 stacks as well as the previous response given in reference to Table 9.2 about the use of ultra-low-sulfur residual fuel oil for Newington Station.

Newington Station, PM₁₀:

“Appendix X indicates that Newington currently has a permitted daily cap of 0.22 lb/MMBtu and currently operates an ESP. Table 9.4, ‘PM₁₀ Emission Reductions Resulting from

Application of BART controls,' lists the current level of control (which is proposed as BART) to be 56%. The MANE-VU BART workgroup recommendation for non-CAIR EGUs, however, is 0.02 - 0.04 lb/MMBtu. Also, as stated in the available retrofit technologies for PM₁₀ control, rebuilt ESPs can achieve collection efficiencies of more than 99%. Therefore, it is not clear why New Hampshire has determined that current controls, which are less stringent than the MANE-VU recommendation, are sufficient for BART. NHDES should examine (and document) other options before concluding that current controls are BART."

The 2002 baseline PM emissions for Newington Station Unit NT1 were 196 tons, representing an estimated removal efficiency of 42% (as corrected in new Table 9.3 and Attachment X). Control costs for ESP technology at this throughput level are estimated to exceed \$20,000 per ton removed. Given the very low utilization rates for this plant since 2002 and the high costs of PM control technology, additional measures for PM control at this facility cannot be justified as BART.

Enforceability:

"Table 9.3 and 9.4 indicate that, for NO_x and PM, respectively, 'current controls (ESP, SCR, etc.) are BART.' It should be noted that BART requirements must be federally enforceable. Therefore, the BART discussion should reference the specific existing federally enforceable requirements that require these 'current controls.' Alternatively, if the requirements implementing the current controls are not yet federally enforceable, they must be submitted to EPA as a SIP revision."

Please see previous response given in reference to Tables 9.3 and 9.4 regarding enforceable requirements and facility permits.

9.4.2 Bart-Eligible EGUs and the role of CAIR – *"Massachusetts is classified as a seasonal CAIR state and should not be included in the list of Non-CAIR states."*

The corresponding statement in the text (now located in Part 9.3.3 of Section 9) has been corrected.

11.5 Additional Factors Considered –

"Section 51.308(d)(3)(v) of the Regional Haze rule states, 'The States must consider, at a minimum, the following factors in developing its long term strategy:

(B) Measures to mitigate the impacts of construction activities;

(C) Emission limitations and schedules for compliance to achieve reasonable progress goals;

(E) Smoke management techniques for agriculture and forestry management purposes including plans as currently exist within the state for these purposes.'

New Hampshire's SIP should include more detail in these areas."

The text on construction activities has been expanded and is now found at 11.6 Measures to Mitigate the Impacts of Construction Activities.

Text on emission limitations and compliance schedules has been added at 11.10 Emission Limitations and Compliance Schedules. Additional relevant text is located at 11.11 Enforceability of Emission Limitations and Control Measures.

The text on agricultural and forestry smoke management has been expanded and is now found at 11.7 Agricultural and Forestry Smoke Management.

11.8-11.9 New Hampshire's share of Emission Reductions – *“More discussion should be included that connects New Hampshire emissions, and emission reductions, with meeting the reasonable progress goals for the Class I areas that New Hampshire impacts. Also, New Hampshire should discuss how it is meeting its apportionment of emission reductions agreed upon in the regional planning process.”*

An expanded description, now found at 11.8 Estimated Effects of Long-Term Strategy on Visibility Improvement, demonstrates that MANE-VU's long-term strategy will achieve visibility improvements surpassing the calculated uniform rate of progress. A new subsection, 11.9 New Hampshire's Share of Emission Reductions, has been added to describe how New Hampshire will meet its share of emission reductions, consistent with the reasonable progress goals.

11.9 New Hampshire's Share of Emission Reductions – *“In discussing New Hampshire's obligation to meet its share of emission reductions, NHDES references: ‘Emission controls on targeted in-state EGUs that contribute to visibility impairment at Class I area in the region – more specifically, compliance with New Hampshire law RSA 125-O, Multiple Pollutant reduction Program, which mandates the installation of scrubbers on PSNH Merrimack Station Units 1 and 2 by July 1, 2013, to control SO₂ and mercury emissions; these controls will reduce SO₂ emissions by a minimum of 80% from 2002 levels;’ In the ‘meeting the ask’ section, the control level of Merrimack station is stated to be in excess of 90%, while in the BART discussion it is expected to be 90%, and the discussion above references 80%. NHDES should clarify what level of SO₂ control will be required and what mechanism is going to be used to make the SO₂ control federally enforceable. In addition, this section discusses a low sulfur fuel strategy. What mechanism is New Hampshire planning to use to make the low sulfur fuel strategy federally enforceable?”*

Please see previous response given for 3.2.2.2 about SO₂ control level and previous response provided in reference to Tables 9.3 and 9.4 regarding enforceability. NHDES has prepared a proposed rule change to require use of low-sulfur fuel oil (see Attachment FF, Draft Revisions to Env-A 1604, Sulfur Content Limits for Liquid Fuels).